

What is claimed is:

1. A device for transmitting an audio and video (A/V) data in network, comprising:

a coder/transmission buffer coding and storing the A/V data, inputted from each of channels within a server providing the A/V data of one channel or multi channels for users connected to the network, to proper size fitting to the network states; and

a user transmission controller transmitting a coded storing data on the coder/transmission buffer to the user;

wherein the users are grouped with the user transmission controllers transmitting the coded data according to the network state of the group, while each of the user transmission controllers is allocated to each of the users connected to the server.

2. A device according to claim 1, wherein one group of the user transmission controllers comprises one coder and one transmission buffer.

3. A method for transmitting an audio and video (A/V) data in network, comprising:

a step of transmitting the A/V data of one channel or multi channel to the coder/transmission buffer;

a step of coding and storing the A/V data transmitted to the coder and the transmission buffer; and

a step of transmitting the coded storing data to each of the users connected to the network through the grouped user transmission controller.

4. A method according to claim 3, wherein the step of coding and storing the A/V data and the step of storing the coded data to the transmission buffer are performed in repeat.

5. A method according to claim 4, wherein the step of coding the A/V data encodes new data after checking the transmission buffer to avoid unnecessary encoding for the data.

6. A method according to claim 4, wherein the step of coding the A/V data comprises:

a step of deciding whether it is necessary to have the key frame data or not; and

a step of coding the data to the key frame data or to the reference frame data according to the decision;

7. A method according to claim 6, the method further comprising:

a step of checking whether 's' numbers of the reference frame data are encoded continuously after encoding the reference frame data; and

a step of memorizing to generate the key frame data in the case that the 's' numbers of the reference frame data are continuously encoded.

8. A method according to claim 4, wherein the step of coding the A/V data comprises:

a step of deciding whether it is necessary to encode new data or not;

a step of deciding whether the key frame is necessary when it is necessary to encode the new data; and

a step of coding the new data to the key frame data or to the reference frame data according to the decision.

9. A method according to claim 8, the method further comprising:

a step of checking whether 's' numbers of the reference frame data are encoded continuously after encoding the reference frame data; and

a step of memorizing to generate the key frame data in the case that the 's' numbers of the reference frame data are continuously encoded.

10. A method according to claim 8, wherein the step of deciding whether it is necessary to encode new data or not, is decided by whether the last generated frame data is transmitted or not.

11. A method according to claim 9, wherein the step of deciding whether it is necessary

to encode new data or not, is decided by whether the last generated frame data is transmitted or not.

12. A method according to claim 7, wherein the step of deciding whether it is necessary to encode new data or not comprises:

a step of deciding whether it is necessary to encode the key frame data or not; and

a step of deciding whether the last generated frame data is transmitted or not.

13. A method according to claim 7, wherein the step of deciding whether it is necessary to encode new data or not comprises:

a step of deciding the network states; and

a step of deciding whether at least one of the last generated 'n' frame data is transmitted or being transmitted to one of the users or not in the case that the network state is good.

14. A method according to claim 7, wherein the step of deciding whether it is necessary to encode new data or not comprises:

a step of deciding whether the key frame data is necessary or not;

a step of deciding whether the network transmission speed is fast enough or not in the case that the key frame data is not necessary;

a step of deciding whether at least one of the last generated 'n' frame data is transmitted or being transmitted to one of the users or not in the case that the network transmission speed is fast enough; and

a step of deciding whether the last generated frame data is transmitted or not in the case that the network transmission speed is not fast.

15. A method according to claim 3, wherein the step of coding and storing the A/V data

transmitted to the coder and the transmission buffer comprises:

- a step of calculating a size of an added frame data to the transmission buffer;
- a step of checking an employing area on the transmission buffer for the added frame data; and
- a step of storing the frame data to the employing area on the transmission buffer.

16. A method according to claim 4, wherein the step of storing the frame data to the transmission buffer comprises:

- a step of deciding whether there is another frame data in the employed area and this will-be corrupted frame data is being transmitted too any user or not;
- a step of deciding whether the key frame data is in the transmission buffer or not in the case that the will-be corrupted frame data is being transmitted;
- a step of memorizing to encode the key frame data in next time in the case that the key frame data is not; and
- a step of storing the memorized key frame data to the transmission buffer.

17. A method according to claim 3, wherein the step of transmitting the coded storing data to each of the users connected to the network through the grouped user transmission controller comprises:

- a step of initializing the user transmission controller;
- a step of deciding whether next frame data transmittable to the users is or not;
- a step of copying the frame data from the transmission buffer to additional memory in the case that the next frame data transmittable to the user is in the transmission buffer;
- a step of transmitting the copied data to the user; and

a step of deciding whether the network is connected or not after transmitting the data.

18. A method according to claim 3, wherein the step of transmitting the coded storing data to each of the users connected to the network through the grouped user transmission controller comprises:

a step of initializing the user transmission controller;

a step of deciding whether the next frame data transmittable to the users is or not;

a step of checking the area of the transmission buffer of the next transmittable frame data instead of copying the frame data to an additional memory to reduce memory usage according to an increase of the users in the case that the frame data transmittable to the user is in the transmission buffer;

a step of transmitting the frame data on the area of the transmission buffer;

a step of deciding whether the frame data area is re-employed by another frame data while transmission;

a step of reporting to the user that the previous transmitted data is a wrong data, in the case that the frame data area is re-employed; and

a step of deciding whether the network is connected or not.

19. A method according to claim 15, wherein the step of transmitting the frame data comprises:

a step of reporting the beginning of the usage; and

a step of reporting the completion of the usage.

20. A method according to claim 16, wherein the step of transmitting the frame data to the users comprises:

a step of reporting the beginning of the usage; and

a step of reporting the completion of the usage.

21. A method according to claim 17, the method further comprising a step of automatically changing the present group to a proper group considering network states in the case that the network is connected.

22. A method according to claim 18, the method further comprising a step of automatically changing the present group to a proper group considering network states in the case that the network is connected.

23. A method according to claim 17, wherein the step of deciding whether the next frame data transmittable to the users is in the transmission buffer comprises:

a step of deciding whether the next frame data transmittable to the users is in the transmission buffer of a specified channel or not.

24. A method according to claim 18, wherein the step of deciding whether the next frame data transmittable to the users is in the transmission buffer comprises:

a step of deciding whether the next frame data transmittable to the users is in the transmission buffer of a specified channel or not.

25. A method according to claim 17, a step of deciding whether the next transmittable frame data is in the transmission buffer in the case of multi channel comprises:

a step of selecting the channel 'i' as the next checking channel with the information of the transmitted channel or the inquired channel basically;

a step of deciding whether the device checks all channels from the selected channel 'i' or not;

a step of deciding whether the channel 'i' is served to the user in the case that there is an unchecked channel or not; and

a step of selecting the channel 'i' by deciding whether the next frame data transmittable to the users is in the transmission buffer of the channel in the case that the channel is served to the users or not.

26. A method according to claim 18, a step of deciding whether the next transmittable frame data is in the transmission buffer in the case of multi channel comprises:

a step of selecting the channel 'i' as the next checking channel with the information of the transmitted channel or the inquired channel basically;

a step of deciding whether the device checks all channels from the selected channel 'i' or not;

a step of deciding whether the channel 'i' is served to the user in the case that there is an unchecked channel or not; and

a step of selecting the channel 'i' by deciding whether the next frame data transmittable to the users is in the transmission buffer of the channel in the case that the channel is served to the users or not.

27. A method according to claim 21, in the case that the oldest generated channel is transmitted at first by considering the synchronism between the channels, the method further comprising:

a step of deciding whether the transmittable channel is fixed after the device completes to check all channel or not; and

a step of deciding whether the generation time of the channel 'i' is older than the generation time of another channels or not after deciding whether the frame data transmittable to the users is in the transmission buffer of the channel.

28. A method according to claim 22, the method further comprising:

a step of deciding whether the difference between the generation time of the

frame data and the present time is less than a predetermined time T to fit on synchronism between the channels more or not; and

a step of memorizing to generate the key frame data in next time in the case that the difference between them is less than the predetermined time T .

29. A method according to claim 17, wherein the step of deciding whether the next frame data transmittable to the users is in the transmission buffer or not comprises:

a step of deciding in detail whether it is the initial transmission or not in the case that the transmittable channel is fixed;

a step of deciding whether the transmission buffer is empty or not in the case of the initial transmission;

a step of selecting any one of the frame data on the transmission buffer as the transmittable frame data in the case that the transmission buffer is not empty, while there is no transmittable frame data in the case that the transmission buffer is empty;

a step of deciding whether the next transmittable frame data is prepared using the information of the frame data transmitted to the user previously in the case that it is not the initial transmission; and

a step of transmitting the next frame data in the case that the next transmittable frame data is prepared, while there is no the next transmittable frame data in the case that the next transmittable frame data is not prepared.

30. A method according to claim 18, wherein the step of deciding whether the next frame data transmittable to the users is in the transmission buffer or not comprises:

a step of deciding in detail whether it is the initial transmission or not in the case that the transmittable channel is fixed;

a step of deciding whether the transmission buffer is empty or not in the case of

the initial transmission;

a step of selecting any one of the frame data on the transmission buffer as the transmittable frame data in the case that the transmission buffer is not empty, while there is no transmittable frame data in the case that the transmission buffer is empty;

a step of deciding whether the next transmittable frame data is prepared using the information of the frame data transmitted to the user previously in the case that it is not the initial transmission; and

a step of transmitting the next frame data in the case that the next transmittable frame data is prepared, while there is no the next transmittable frame data in the case that the next transmittable frame data is not prepared.

31. A method according to claim 17, wherein the step of deciding whether the next frame data transmittable to the user is in the transmission buffer or not comprises:

a step of checking whether the next transmittable frame data is in the transmission buffer using the information of the frame data previously transmitted to the user in the case that the key frame data and the reference frame data are not discriminately coded and the transmittable channel is fixed;

a step of checking there is a frame data generated later than the next transmitted frame data in the case that the next transmitted frame data is prepared;

a step selecting the last generated frame data as the next transmittable frame data in the case that there is frame data generated later than the next transmitted frame data;

a step of deciding whether a key frame data is generated later than the key frame data transmitted to the user recently in the case that the key frame data and the reference frame data is discriminately coded, or not; and

a step of selecting the last generated key frame data as the next frame data in the case that a more recently generated key frame data is.

32. A method according to claim 18, wherein the step of deciding whether the next frame data transmittable to the user is in the transmission buffer or not comprises:

a step of checking whether the next transmittable frame data is in the transmission buffer using the information of the frame data previously transmitted to the user in the case that the key frame data and the reference frame data are not discriminately coded and the transmittable channel is fixed;

a step of checking there is a frame data generated later than the next transmitted frame data in the case that the next transmitted frame data is prepared;

a step selecting the last generated frame data as the next transmittable frame data in the case that there is frame data generated later than the next transmitted frame data;

a step of deciding whether a key frame data is generated later than the key frame data transmitted to the user recently in the case that the key frame data and the reference frame data is discriminately coded, or not; and

a step of selecting the last generated key frame data as the next frame data in the case that a more recently generated key frame data is.

33. A method according to claim 17, wherein the step of deciding whether the next frame data transmittable to the users is in the transmission buffer or not comprises:

a step of deciding whether it is the initial transmission state for the user or not;

a step of deciding whether there is the key frame data in the case that it is the initial transmission; and

a step of memorizing to generate a key frame data in the case that there is no

key frame data.

34. A method according to claim 18, wherein the step of deciding whether the next frame data transmittable to the users is in the transmission buffer or not comprises:

a step of deciding whether it is the initial transmission state for the user or not;

a step of deciding whether there is the key frame data in the case that it is the initial transmission; and

a step of memorizing to generate a key frame data in the case that there is no key frame data.

35. A method according to claim 17, wherein the step of deciding whether the next frame data transmittable to the user is in the transmission buffer or not comprises:

a step of deciding whether the area of the frame data transmitted previously in the transmission buffer is re-employed or not when the transmittable channel is fixed, the transmittable frame data on the transmission buffer is transmitted without copying the transmittable frame data from the transmission buffer to the additional memory, to reduce the memory usage according to the increase of the users;

a step of deciding whether a key frame data is generated later than the key frame data transmitted to the users previously in the case that the key frame data and the reference frame data are discriminately coded, or changing the state into the initial transmission state in the case that the key frame data and the reference frame data are not discriminately coded and the area of the transmission buffer is re-employed;

a step of memorizing to generate a key frame data by the coder in the case that there is no last generated key frame data recently; and

a step of determining the next transmittable frame data in the case that there is the last generated key frame data recently.

36. A method according to claim 18, wherein the step of deciding whether the next frame data transmittable to the user is in the transmission buffer or not comprises:

a step of deciding whether the area of the frame data transmitted previously in the transmission buffer is re-employed or not when the transmittable channel is fixed, the transmittable frame data on the transmission buffer is transmitted without copying the transmittable frame data from the transmission buffer to the additional memory, to reduce the memory usage according to the increase of the users;

a step of deciding whether a key frame data is generated later than the key frame data transmitted to the users previously in the case that the key frame data and the reference frame data are discriminately coded, or changing the state into the initial transmission state in the case that the key frame data and the reference frame data are not discriminately coded and the area of the transmission buffer is re-employed;

a step of memorizing to generate a key frame data by the coder in the case that there is no last generated key frame data recently; and

a step of determining the next transmittable frame data in the case that there is the last generated key frame data recently.